Pradeep Kumar D. S.

Zoho Corporations India
Research and Engineering Scientist

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(Coding Skills) Java, Python, Android, OpenNLP, Javascript, C/C++, ANTLR, GoLang, LLVM, ByteCode, Smali
(Reviewer) Journal Of Computers and Security (ELSEVIER)

CAREER OBJECTIVES

On advancing my expertise in cybersecurity and undertaking critical challenges, my goal is to deliver my insights and findings to the pedagogical and research activities so that it would tremendously help produce future leaders who would effectively manage our national cybersecurity issues.

EDUCATION

Ph.D.	Computer Science	VIT University, Chennai, India	8.41/10	(ABD) March 2024
M.S.	Computer Science	CEG, Anna University, Chennai, India	7.1/10	December 2010
B.E.	Computer Science	University of Madras	75%	April 2004

M.S. (By Research). Dissertation Title: Object Migration in a Class-Based Ownership Environment
Advisor: Dr. Saswathi Mukherjee

Ph.D. Dissertation Title: Effective Android Malware Mitigation Framework using Ownership-based Protection and Machine Learning Techniques
Advisor: Dr. Geetha S

EMPLOYMENT & EXPERIENCE

Zoho Corporations, India	**July 2023 to Current**	**Research and Engineering Scientist**

- **Responsibilities at Zoho:** Research and development of novel ideas by prototyping the ideas and patenting them.

***Filed 1 Patent on Generative AI and Responsive AI based CAPTCHA security**
***Filed 2 Patents on UI and Human Interface Design with responsive and Bayesian network**
***Filed 2 Patents on Memory Management in Programming Languages**

VIT University	**July 2020 to June 2023**	**Research and Teaching Assistant**

Responsibilities at VIT University:

- Handling Labs for Bachelor and Masters Students.
- Project Guidance to Bachelor and Masters Students.
- Conducting Exams in Software Engineering, Programming, Information and Network Security, and Machine Learning Subjects.

SKAN AI	**Aug 2022 to Feb 2023**	**Intern (Data Science)**

- **Responsibilities at SKAN AI:** Work on Creating ML Automation and NLP analysis and Tool design to process the backend data. Visualization of the data by providing suggestion on the context.

SEFCOM LABS, Arizona State University	**Mar 2019 to Apr 2020**	**Research Scholar (Intern)**

– **Responsibilities at SEFCOM:** Work on Android Communication Security, LTE Network Security, Security Analysis using Machine Learning and AI. Developed Android Security benchmark, Ensemble Learning for LTE network real-time traffic sniffing.		
Accenture Labs, Bangalore	**June 2011 to Mar 2019**	**Associate Principal – R&D**
– **Responsibilities at Accenture:** Create research prototypes, write research papers, and having regular client meetings. Actively coordinating by building relationships and serving as a technology expert when working with clients' teams. Implement and execute projects with other Accenture Software Engineering group. Presenting the solution to our leadership and filing patents.		
Sasken Communications Tech. Ltd	**May 2010 to June 2011**	**Senior Engineer – Software**
– **Responsibilities at Sasken:** Worked as an onsite consultant for our client ST Ericsson, Bangalore. Worked in creating GPS and AGPS solutions using C and Java. Scrum interaction with the client's team, providing solution and understanding their requirements.		
TE Software Services Pvt.Ltd.	**September 2009 to April 2010**	**Software Engineer**
– **Responsibilities at TE Software:** Worked in Android Application Development. Organize the scrum meeting, involve in application design meetings, understand the business requirements and design modules and implement with respective teams.		
DCSE, CEG, Anna University.	**June 2007 to August 2009**	**Research Assistant**
– **Responsibilities at DCSE:** Build on research ideas and directions provided by the Professor in order to deliver a quality paper and presentation. Understand the research problem and requirement and to provide research ideas, publish papers in conferences and to co-ordinate with different department leads.		

HONORS AND AWARDS

1. **Got 1st Price in National Cybersecurity R&D Roadshow held at Indian Institute of Science, Bangalore** — February 2023
2. **Awarded – VIT's RAMAN RESEARCH AWARD (November 2022) – Cash Award (Rs. 10,000)** — November 2022
3. Participated in **Karnataka Government Blockchain Hackathon 2018 (Bangalore).** — November 2018
4. **ATL Monthly Sunshine Award – August 2016** — August 2016
5. **Intellectual Property Creator – Publications (2014), Accenture Technology Labs.** — August 2014
6. **Young Inventor Award - 2013, Accenture Technology Labs.** — September 2013
7. **Spirit of Innovation Award - 2013, Accenture Technology Labs.** — August 2013
8. **Achievement of the Month – 2012, Accenture Technology Labs.** — August 2012
9. Received **performance recognition** for designing the Salesforce's APEX language parser from the scratch. — August 2012

RESEARCH EXPERIENCE

- **PendingMutent:**
  - a dynamic PendingIntent security framework based on Ownership-Domain Principle
- **MuTent/Arc:**
  - a lightweight security library for Android Intent communication + encryption
- **LTE Traffic Analysis (Mapping Physical Layer to App Layer):**
  - a ML based classification of realtime traffic patterns to identify the users' behaviour
- **Blockchain Digitizability Metrics:**
  - a novel digitizability metrics to validate Software Requirement for Blockchain using NLP techniques
- **E-Government Document Attack Prevention:**
  - Secure Blockchain-based Document Validation to prevent document based Shadow Attacks
- **Jtrust:**
  - Implemented my own toy Programming Language called – JTrust
- **Typelet:**
  - Created a novel security model by combining Typesystem + Number System

- **muCalculus:**
  - Created a Dynamic Security Calculus combining Encapsulation + Dynamic Object Movement

TEACHING & RESEARCH ACTIVITIES

- Teaching Activities at **VIT (2020 – 2023)**
  - Handling Labs for Bachelor and Masters Students under the following courses:
    - Machine Learning
    - Network Security
    - Software Engineering
    - Data Structures and Algorithms
    - Information Security Analysis and Audit

- Teaching & Activities at **ASU (2019 – 2020)**
  - Blockchain Innovation Challenge, ASU Skysong 09/2019
    - ∗ Solid foundations for blockchain technology by identifying use cases
    - ∗ Team (3): 1 postgraduate, 1 phd student, myself

- Students Mentoring
  - JComponent Project Advisor and Judge 01/2023 – 05/2023
    - ∗ Offered guidance on research methods, data collection and analysis, and literature review
    - ∗ Assisted with the discussion on identifying the novelty of the research projects

PROFESSIONAL SERVICES

Paper Reviwers

- Journal of Computers and Security (Elsevier) 2023 – Current

KEY PROJECTS

PROJECT	DESRIPTION	TECHNOLOGY	CODE/OUTCOME
Skan Event Analyzer	User Events are collected in MongoDB which will be analysed based on event categories	**Python, Flask, Bootstrap, HTML, MongoDB, REST API, Matplotlib**	**Tool**
Android Communication Security – <u>Collaboration with</u> @Arizona State University,	Static Analysis of Android Application and Dynamic Policy Framework to control App in Android Enterprise Environment	**Java, Golang, Android, SOOT, SQLite**	Research Paper + Android Enterprise Engine (Golang) Static Analyzer (SOOT + Java Models).

@Texas A&M Corpus Christi, and @VIT University, India	Benefits: BYOD Environment can be monitored for vulnerable app usage.		
Unsupervised Clustering using Mahalanobis Distance Metrics @VIT University, India	This project aims at identifying Zero-Day Attack.	**Python,** **K-Means Clustering** **Mahalanobis Distance Metrics**	MULBER Tool Journal Publication Benefits: Mahalanobis Distance metrics (rather than Eculidean Metrics), our system can cluster the new or unknown data to appropriate cluster with 95% accuracy.
Android Application Collaboration Security, (solution to CVE-2018-9489) @SEFCOM Labs, Arizona State University (USA)	Dynamically Sensing Application behaviour based on pre-learned vulnerability flow	**Java, C/C++, Android, ANTLR, Ubuntu**	A New Android Encryption Model + Research Paper. Benefits: Removes rules-driven security model.
User Dynamics Prediction + Security Prediction on the Air Sniffing (LTE + 5G) @SEFCOM Labs, Arizona State University (USA)	Sniffing L1 Layer packets in open network, and using machine learning model to identify the user's application usage, time-of usage, connection between users and user preferences. .	**Python** **Random Forest, Bagging** **Distributed Learning** **Matplotlib**	A Novel Machine Learning based LTE Analysis model Research Paper. Benefits: Used for app-preference driven AD pushing
Trusted Artificial Learning and Knowledge Sharing @Accenture Labs, Bangalore	Automated Bots learn knowledge based on geo-location and shares the learning knowledge among its peers. Classified the Learned Knowledge as private or protected or public	**Android** **Java** **SQLite** **Federated Learning**	USA Patent. Benefits: Used for Automated Cars + Multi-Cloud Architecture.

OTHER ACHIEVEMENTS

Patents

- ✓ **US11256712B2, Pradeepkumar DURAISAMY SOUNDRAPANDIAN,** Kapil Singi, Vikrant Kaulgud, RAPID DESIGN, DEVELOPMENT, AND REUSE OF BLOCKCHAIN ENVIRONMENT AND SMART CONTRACTS.
- ✓ **US20180075363A1, Pradeepkumar DURAISAMY SOUNDRAPANDIAN**, Shrikanth NARAYANASWAMY CHANDRASEKARAN, Aditya Bhola, Venkatesh Subramania, Vikrant Kaulgud, Sanjay Podder, Automated Inference Of Evidence From Log Information.
- ✓ **US10643102B2,** Shrikanth NARAYANASWAMY CHANDRASEKARAN, Venkatesh Subramanian, Anutosh Maitra, Anurag Dwarakanath, **Pradeepkumar Duraisamy Soundrapandian**, Aditya Bhola, Incident prediction and prevention.
- ✓ **US10922654B2,** Kapil Singi, Vikrant S. KAULGUD, Sanjay Podder, Afsal Marattil, **Pradeepkumar DURAISAMY SOUNDRAPANDIAN**, Software assurance and trust in a distributed delivery environment.
- ✓ **US10832187B2,** Vibhu Saujanya Sharma, Vikrant S. KAULGUD, Parikshit MANIAR, Sanjeev Vohra, Sanjay Mittal, Aravindan Thoppe Santharam, Michael A. Brinkley, Gurdeep Virdi, **Pradeepkumar DURAISAMY SOUNDRAPANDIAN**, Data processor for integrating agile development projects into an end-to-end development platform.
- ✓ **CA2932644C**, Vibhu S. Sharma, Vikrant S. Kaulgud, Parikshit Maniar, Sanjeev Vohra, Sanjay Mittal, Arvindan Thoppe Santharam, Michael A. Brinkley, Gurdeep Virdi, **Pradeepkumar Duraisamy Soundrapandian**, DATA PROCESSOR FOR PROJECT DATA.
- ✓ **US20160364675A1,** Vibhu S. Sharma, Vikrant S. Kaulgud, Parikshit Maniar, Sanjeev Vohra, Sanjay Mittal, Arvindan Thoppe Santharam, Michael A. Brinkley, Gurdeep Virdi, **Pradeepkumar Duraisamy Soundrapandian**, DATA PROCESSOR FOR PROJECT DATA.

- **Pradeepkumar Duraisamy Soundrapandian**, Punithavathi P, "Image Captcha Using Generative AI" – Filed (US) 2023

- "A Method and System for analyzing and visualizing paths of execution in Salesforce systems"– Filed (US) – 2012
- "SYSTEM FOR SOFTWARE ASSURANCE AND TRUST IN A DISTRIBUTED MULTI-VENDOR DELIVERY ENVIRONMENT" – Filed (US) 2018
- "System For Automated sharing and acquiring of knowledge by bot or human collaborative environment" – Filed (US) 2019
- "System For choreographing and Recommendation of apps based on collective intelligence and prediction capability" – Filed (US) 2019

REFERENCES

Dr Geetha S Professor and Associate Dean (Research), Computer Science and Engineering, VIT University, India, geetha.s@vit.ac.in	Dr. Asha Murugan Asst. Professor Adhoc, Computer Science and Engineering, National Institute of Technology Rourkela, India, ashas@nitrkl.ac.in	Dr. Jaejong Baek Assistant Teaching Professor, School of Computing and Augmented Intelligence, Arizona State University, jbaek7@asu.edu